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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/120,608 07/22/98 PAGE

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E. I DU PONT DE NEMOURS AND COMPANY
LEGAL PATENTS
WILMINGTON DE 19898

EXAMINER

SHDSHO, C

ART UNIT

PAPER NUMBER

1714

2

DATE MAILED:

05/10/99

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/120,608

Applicant(s)

Page et al.

Examiner

Callie Shosho

Group Art Unit

1714



☐ Responsive to communication(s) filed on _____

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) 1-12 is/are pending in the application.

Of the above, claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 1-12 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been
☐ received.

☐ received in Application No. (Series Code/Serial Number) _____.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☒ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities:

It is preferred that application numbers are used in place of attorney docket numbers on page 3, lines 31 in order that the examiner is able to examine the referenced applications and properly determine the patentable lines of demarcation.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. When the scope of claims 3 and 10 encompasses ethoxytriethylene glycol, methoxypolyethylene oxide (meth)acrylate, and polyethylene oxide (meth)acrylate, the rejection in paragraph 4 below applies.

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

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4. Claims 1-7 and 9-11 are rejected under 35 U.S.C. 102(e) as being anticipated by Ma et al. (EP 0826751).

Ma et al. disclose a graft copolymer which has a hydrophobic backbone and hydrophilic side chains (page 2, lines 56-58) which are made from nonionic monomers (page 5, line 38). The hydrophobic portion binds with the insoluble colorant, while the hydrophilic portion is soluble in the aqueous carrier medium (page 4, lines 23-24). The ratio of the hydrophobic portion to the hydrophilic portion ranges from 90:10 to 10:90 (col.4, lines 23-24). By varying this ratio, the hydrophobicity/hydrophilicity balance changes which results in a graft copolymer with a varying degree of solubility in water as well as the aqueous medium.

The hydrophobic monomers include phenyl (meth)acrylate, benzyl (meth)acrylate, 2-phenylethyl (meth)acrylate, 2-phenoxyethyl (meth)acrylate, 1-naphthalyl acrylate, 2-naphthalyl (meth)acrylate, p-nitrophenyl (meth)acrylate, phthalimidomethyl (meth)acrylate, N-phenyl (meth)acrylamide, N-benzyl acrylamide, N-(2-phenylethyl)acrylamide, N-(2-phthalimidoethoxymethyl) acrylamide, vinyl benzoate, methyl (meth)acrylate, ethyl (meth)acrylate, n-butyl (meth)acrylate, 2-ethylhexyl (meth)acrylate, t-butyl methacrylate, cyclohexyl methacrylate, styrene, alpha-methyl styrene, vinyl acetate, vinyl butyrate (page 4, line 58-page 5, line 11).

The hydrophilic side chains are macromonomers (page 5, lines 54-55) which comprise 10-90%, or preferably, 20-50% of the graft copolymer (page 4, lines 24-25). The side chains are made from non-ionic monomers such as ethoxytriethyleneglycol methacrylate,

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methoxypolyethyleneglycol monomethacrylate, 2-hydroxyethyl acrylate, and 2-hydroxyethyl methacrylate (page 5, lines 45-48). Given that all the reference monomers are of the form $\text{CH}_2=\text{C}(\text{R}_3)(\text{C}(\text{O})\text{OX}_n(\text{CH}_2\text{CH}_2\text{O})_m)\text{R}_4$ (page 5, lines 40-44) where the $(\text{CH}_2\text{CH}_2\text{O})_m$ group represents either a polyethylene glycol or a polyethylene oxide, and absent any evidence to the contrary, it is presumed that the reference methoxypolyethyleneglycol monomethacrylate, 2-hydroxyethyl acrylate, and 2-hydroxyethyl methacrylate are identical to the claimed methoxypolyethylene oxide methacrylate, polyethyleneoxide methacrylate, and polyethylene oxide-acrylate.

With respect to the number average molecular weight, M_n , of the side chains, while it is disclosed that the hydrophilic side chains have a molecular weight of 1,000-50,000, or preferably 1,000-10,000 (col.6, lines 9-10), there is no explicit disclosure of M_n of the side chains in the reference. However, given that M_n is defined as $\sum N_i M_i / \sum N_i$ where N is the number of side chains and M_i is the molecular weight of an individual side chain, and in light of the fact that the "minimum" value of M_i is 1,000 as disclosed above, it is evident that M_n cannot be less than 1,000, and thus meets the claimed number average molecular weight requirement of at least 500.

The aqueous medium is a mixture of 30-95% water and at least one water-miscible organic solvent (col.3, lines 21-20 and 24-25).

There is further disclosed an aqueous ink composition which comprises (1) an aqueous vehicle comprising water and at least one water-miscible organic solvent wherein water comprises 30-95% of the aqueous medium and (2) a non-ionic graft copolymer containing a

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hydrophobic backbone and hydrophilic side chains made from nonionic monomers as described above (page 35, line 57-page 36, line 4). While Ma et al. describes the use of the graft copolymer in ink jet inks, it is also disclosed that graft copolymer is used in many applications including paints (page 3, lines 4-6 and 12-13).

Claim Rejections - 35 USC § 103

5. When the scope of claims 3 and 10 encompasses vinyl pyrrolidone, the rejection in paragraph 7 below applies.

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

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7. Claims 3 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ma et al. (EP 0826751) in view of Satake et al. (U.S. 5,814,685).

Ma et al. '751 disclose an aqueous ink composition as described in paragraph 4 above and which is incorporated here by reference.

The difference between Ma et al. and the present claimed invention is the requirement in the claims of vinyl pyrrolidone hydrophilic monomer.

Satake et al., which is drawn to ink jet inks, disclose a graft copolymer composed of hydrophobic and hydrophilic portions wherein the hydrophilic monomers include vinyl pyrrolidone (col.4, line 46).

The motivation for using vinyl pyrrolidone as a hydrophilic monomer in a graft copolymer is that vinyl pyrrolidone imparts toughness and water resistance to the ink composition (col.3, lines 20-21).

In light of the motivation for using a hydrophilic vinyl pyrrolidone monomer disclosed by Satake et al. as described above, it therefore would have been obvious to one of ordinary skill in the art use vinyl pyrrolidone as a hydrophilic monomer in the graft copolymer of Ma et al. in order to produce a tough, water resistant ink, and thereby arrive at the claimed invention.

8. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ma et al. '751 (EP 0826751) in view of Ma et al. '698 (U.S. 5,085,698) and Yamashita et al. (U.S. 5,883,157).

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Ma et al. '751 disclose an aqueous ink composition as described in paragraph 4 above and which is incorporated here by reference. Ma et al. '751 further disclose that the composition can contain a surfactant (page 6, line 57) such as a silicone surfactant (page 7, line 35) and solvents such as 2-pyrrolidone (page 28, line 41).

The difference between Ma et al. '751 and the present claimed invention is the requirement in the claims of (a) glycol ether solvents and (b) fluorinated surfactants.

With respect to difference (a), Ma et al. '751 disclose that at least one solvent is used in the aqueous carrier medium and that the particular mixture depends on the requirements of the specific application such as desired surface tension, viscosity, drying time, etc. (page 3, lines 21-23). Ma et al. '698, which is drawn to ink jet inks, disclose the use of solvents such as pyrrolidone and glycol ethers (col.9, lines 3-10).

Therefore, it therefore would have been obvious to one of ordinary skill, recognizing that the choice of solvents depends on the desired end use, to choose particular solvents, including pyrrolidone and glycol ether as presently claimed, as the solvents in the ink jet ink of Ma et al. '751, in order to produce an ink possessing optimal drying time, surface tension, and viscosity, and thereby arrive at the claimed invention.

With respect to difference (b), Yamashita et al., which is drawn to ink jet inks, disclose the use of fluorinated surfactants (col.4, lines 15-16). It is disclosed that the motivation for using this type of surfactant is conventional in that it is used to stabilize the dispersion of colorants,

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enhance the penetration of the ink into the paper to improve drying, and to control wetting which will prevent feathering and bleeding of the ink.

In light of the motivation for using fluorinated surfactants disclosed by Yamashita et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use fluorinated surfactants in the ink jet ink composition of Ma et al. '751 in order to produce a stable ink that has improved drying and minimal feathering and bleeding, and thereby arrive at the claimed invention.

9. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Held (U.S. 5,853,861) in view of Ma et al. (EP 0826751).

The following rejection gives patentable weight to the claim preamble. However, before setting forth the rejection, it should be noted that MPEP 2111.02 states that "the preamble is not given the effect of a limitation unless it breathes life and meaning into the claim" and that a claim preamble is not generally accorded any patentable weight "where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone." Therefore, while claim 12 discloses a washfast ink composition for use in printing of textiles, the claim does not depend on the preamble for completeness, i.e. the aqueous vehicle, colorant, and graft copolymer would be able to stand alone as an ink composition even without

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the preamble which is not essential to defining the invention, and thus, it is not necessary to give the preamble patentable weight.

Held discloses a washfast ink composition for use in printing textiles (col.3, lines 35-37) which comprises (1) an aqueous carrier medium containing water and at least one water-soluble organic solvent wherein the aqueous carrier medium comprises 30-95% water (col.3, lines 49-50 and 60-62), (2) colorant (col.4, line 5), and (3) graft copolymer which contains hydrophilic and hydrophobic monomers (col.4, lines 46-54 and 65-66).

The difference between Held and the present claimed invention is the requirement in the claims of a specific graft copolymer.

While Held discloses that a graft copolymer containing hydrophilic and hydrophobic monomers is used, there is no explicit disclosure of the ionic nature of the graft copolymer, the number average molecular weight of the side chains, or the solubility of the graft copolymer.

Ma et al. disclose a graft copolymer which has a hydrophobic backbone and hydrophilic side chains (page 2, lines 56-58) which are made from nonionic monomers (page 5, line 38). The hydrophobic portion binds with the insoluble colorant, while the hydrophilic portion is soluble in the aqueous carrier medium (page 4, lines 23-24). The ratio of the hydrophobic portion to the hydrophilic portion ranges from 90:10 to 10:90 (col.4, lines 23-24). By varying this ratio, the hydrophobicity/hydrophilicity balance changes resulting in a graft copolymer with varying degrees of solubility in water as well as the aqueous medium. With respect to the number average molecular weight, M_n , of the side chains, while it is disclosed that the hydrophilic side chains

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have a molecular weight of 1,000-50,000, or preferably 1,000-10,000 (col.6, lines 9-10), there is no explicit disclosure of M_n of the side chains in the reference. However, given that M_n is defined as $\sum N_i M_i / \sum N_i$ where N is the number of side chains and M_i is the molecular weight of an individual side chain, and in light of the fact that the "minimum" value of M_i is 1,000 as disclosed above, it is evident that M_n cannot be less than 1,000, and thus meets the claimed number average molecular weight requirement of at least 500.

The motivation for using this graft copolymer is that the graft copolymer disperses the colorant and thus produces a stable ink by preventing flocculation of the colorant particles (page 2, lines 44-45).

In light of the motivation for using a specific graft copolymer disclosed by Ma et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use the graft copolymer in the ink composition of Held in order to produce a stable ink, and thereby arrive at the claimed invention.

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following prior art disclosed graft copolymers:

Chu et al. (U.S. 5,231,131)

Yamamoto et al. (U.S. 5,888,253)

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11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Callie Shosho whose telephone number is (703) 305-0208. The examiner can normally be reached on Monday-Thursday from 7:00 am to 4:30 pm. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan, can be reached on (703) 306-2777. The fax phone number for the organization where this application or proceeding is assigned is (703) 305-3599.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

C. 8.

Callie Shosho
5/4/99

Vasu Jagannathan
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